EDITORIAL.

THE era of machinery appears to have arrived for American botany. It was probably inevitable whenever physiological studies attracted sufficient attention to take a prominent part in the curriculum. But just the manner and time of its advent could hardly have been anticipated. The elaborate auxanometers, clinostats and other special pieces used in foreign laboratories, made familiar to American botanists through books and journals, described by visitors to Tübingen, Leipzig, Cambridge, Vienna and other famous centers of research, and of which a sample instrument has occasionally been purchased for the general equipment of a laboratory in this country, seemed too expensive and too difficult to obtain ever to become common in America.

At first very simple appliances served the teacher's purpose. The demonstration of transpiration was made by passing a fresh sprig through pasteboard over a tumbler of water, and inverting another tumbler over it, and heliotropism was shown by setting a plant before a window. The need of accurate records led to the adoption of various mechanical methods. Special devices for demonstrating growth were first brought forward. More than a decade ago Professor Bessey's arc indicator became well known, and a few years later the rather elaborate machines devised by Professor Barnes and Mr. Bumpus were figured and described in the journals, and very recently Miss Golden's auxanometer has been described. About three years ago Mr. Swezey described a centrifugal apparatus for studying geotropism, and two years ago Professor Thomas illustrated and described an apparatus for recording root pressure. Other apparatus has from time to time been devised and some of it described in the journals or before societies. But none of these pieces could be obtained in the market. Each laboratory was still obliged to make its own apparatus, or import from foreign makers.

The first pieces of physiological apparatus emanating from an American laboratory, duplicates of which could be purchased, were an auxanometer and centrifugal apparatus originating at Purdue University, and displayed at the Madison meeting of the A. A. A. S. last year. The considerable number of laboratories which have availed themselves within the year of the chance of securing these pieces of apparatus, shows that the plan of offering newly devised apparatus for sale meets with favor.

A circular recently distributed from the botanical laboratories of the University of Minnesota offers the botanical public three ingenious pieces of apparatus: an electrical auxanometer, a registering balance, and a recording apparatus to be used with either of the preceding.

While visiting the botanical laboratories of Wabash College a short time since the writer saw a beautifully made apparatus for recording root pressure, of which duplicates can probably be obtained shortly. There may be other laboratories of research, fortunate enough to command the services of skilled mechanics, already contemplating sharing the results of study and skill with their fellow workers. Certainly we should not be surprised to hear of such, now that the method is fairly inaugurated.

American botanists are an enthusiastic class, and are credited with being well endowed with the proverbial ingenuity of the Yankee, so that having turned their attention to providing their own mechanical devices for studying plants, many compact and efficient designs may be confidently anticipated.

The movement is one to be highly commended. It is only second to the supply of suitable text books in its power to advance the interests of the science of physiology in the higher institutions of learning. It is clearly the precursor to more accurate methods of research in the several lines requiring close measurement. As such instruments become more common, finer methods will prevail, more delicately adjusted machines will be demanded, and more profound studies will be possible. It is one way, possibly the only way, by which American laboratories can hope to attain to a position that will enable them to equal those of Europe in the lines of research requring such apparatus.

Other claims for the wide reaching influence of this movement might be made. It is at least likely to liberalize the prevailing views regarding the requirements for a well equipped laboratory.